

CLAIMS

What is claimed is:

1. A content addressable memory ("CAM") system comprising a
5 plurality of segments arranged in an array, wherein each of the plurality of
segments includes a plurality of CAM cells.
2. A system as defined in Claim 1 wherein each of the plurality
CAM cells comprises a wordline, a matchline and a sinkline, the wordline
10 being shared by all of the cells in the same row, the matchline and sinkline
being shared by all of the cells in the same segment.
3. A system as defined in Claim 1, further comprising gap logic
between any two segments to propagate the matchline and sinkline
15 information from segment to segment.
4. A system as defined in Claim 1 wherein searching is done in a
pipeline process, and when the first segment of the first row is completed in
search, the search is continued to proceed to the second segment of the first
20 row, while at the same time, a new search is started to proceed on the first
segment of the second row.
5. A system as defined in Claim 4 wherein the search procedure
on any row will not be continued when a mismatch is detected in any
25 segment of that row.
6. A method of searching within a CAM system, the method
comprising:

providing an input word to the CAM system;
comparing a portion of the input word in a segment of the CAM
system; and
propagating a mismatch to obviate the need for comparison in other
5 segments of the CAM system.

7. A method as defined in Claim 6, further comprising:
comparing the input word with data from a plurality of wordlines, each
wordline being shared by all of the cells in the same row;
10 propagating a match or mismatch on a matchline, each matchline
being shared by all of the cells in the same segment; and
grounding through a sinkline when a mismatch is found in a segment,
each sinkline being shared by all of the cells in the same segment.

15 8. A method as defined in Claim 6, further comprising propagating
the matchline and sinkline information from segment to segment through gap
logic between each segment and the next segment.

9. A method as defined in Claim 6, further comprising:
20 searching in a pipeline process;
continuing a first search into the second segment of the first row when
the first segment of the first row is completed; and
starting a second search to proceed on the first segment of the second
row at the same time that the first search is continued into the second
25 segment of the first row.

10. A method as defined in Claim 9 wherein the search procedure
on any row will not be continued when a mismatch is detected in any

segment of that row.

11. A content addressable memory ("CAM") device comprising:
a plurality of segments arranged in an array, wherein each of the
5 plurality of segments includes a plurality of CAM cells.

12. A device as defined in Claim 11 wherein each of the plurality
CAM cells comprises a wordline, a matchline and a sinkline, the wordline
being shared by all of the cells in the same row, the matchline and sinkline
10 being shared by all of the cells in the same segment.

13. A device as defined in Claim 11, further comprising gap logic
between any two segments to propagate the matchline and sinkline
information from segment to segment.
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14. A device as defined in Claim 11 wherein searching is done in a
pipeline process, and when the first segment of the first row is completed in
search, the search is continued to proceed to the second segment of the first
row, while at the same time, a new search is started to proceed on the first
20 segment of the second row.

15. A device as defined in Claim 14 wherein the search procedure
on any row will not be continued when a mismatch is detected in any
segment of that row.

25 16. A content addressable memory ("CAM") device comprising:
searching means for searching within the CAM device;
receiving means for providing an input word to the CAM device;

comparing means for comparing a portion of the input word in a segment of the CAM device; and

propagating means for propagating a mismatch to obviate the need for comparison in other segments of the CAM device.

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17. A device as defined in Claim 16, further comprising:

a plurality of comparing means for comparing the input word with data from a plurality of wordlines, each wordline being shared by all of the cells in the same row;

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matching means for propagating a match or mismatch on a matchline, each matchline being shared by all of the cells in the same segment; and

grounding means for grounding through a sinkline when a mismatch is found in a segment, each sinkline being shared by all of the cells in the same segment.

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18. A device as defined in Claim 16, further comprising:

gap logic means between each segment for propagating the matchline and sinkline information from segment to segment.

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19. A device as defined in Claim 16, further comprising:

pipeline means for searching in a pipeline process;

continuation means for continuing a first search into the second segment of the first row when the first segment of the first row is completed; and

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synchronization means for starting a second search to proceed on the first segment of the second row at the same time that the first search is continued into the second segment of the first row.

20. A device as defined in Claim 19, further comprising:

mismatching means wherein the search procedure on any row will not be continued when a mismatch is detected in any segment of that row.